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Applicant: J. Carl Cooper

Examiner: Minsun Oh Harvey
Art Unit: 2644

Serial No: 08/824,496

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For : Improved IFB System Apparatus and Method

Docket Number: JCC 396A
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DECLARATION UNDER 37 C.F.R. §1.132

1. My name is J. Carl Cooper. I am the applicant and have appointed myself as agent in the above identified application.
2. I am of sound mind, capable of making this Declaration, and personally acquainted with the facts stated in this Affidavit which are true and correct.
3. I earned a Bachelor of Science degree in Electrical Engineering from Oklahoma State University in 1972. As part of the curriculum leading to that degree I studied electronic circuitry of the type which is utilized in the present invention and which is utilized in the Kirby et al. UK Patent Application GB 2269968 and the paper "The Phase Correlation Image Alignment Method" by CD Kuglin and DC Hines which is referenced therein at page 4.
4. I was working in the art to which the invention of my above identified patent application pertains as of the filing date of the application, and I am familiar with the level of ordinary skill therein as of that date.
5. I have read and studied the UK Patent Application GB 2269968 and the paper "The Phase Correlation Image Alignment Method" by CD Kuglin and DC Hines which is referenced

therein at page 4, and I am knowledgeable of their contents and teachings as would be understood by the person of ordinary skill in the art to which the invention of my above identified patent application pertains.

6. I have written and prosecuted the above identified application and the claims therein and I am familiar with the meaning of the claims thereof to the person of ordinary skill in the art, as well as the standards for patentability under 35 U.S.C. §102 and 112.

7. The examiner's interpretation of Kirby's element 32 is that it performs variable delay and variable gain of the delayed talent signal. I disagree with the examiner's interpretation.

8. Kirby teaches that the "adaptive cancellation circuit 30 automatically corrects for any remaining small delays between the signals" (second paragraph at page 4) and describes that this is done by "with the situation where more severe phase or amplitude effects are being introduced, ... it may be beneficial to employ several adaptive cancellation circuits operating in parallel as shown in Figure 2" (third paragraph of page 5).

9. Kirby specifically teaches using "two identical filter banks 41 and 42, or similar units, are employed ... , and are located after the delays 21, 22 to avoid the need to duplicate the delays" (emphasis added).

10. The examiner asserts that the adaptive filter 32 is a variable delay.

11. Adaptive filter 32 "comprises a series of one-sample delays arranged to provide simultaneously a sequence of adjacent samples, multipliers for multiplying the sample values by respective filter coefficients, and combining circuits for adding the outputs of the multipliers" (last paragraph of page 6).

12. The adaptive filter is a fixed tapped shift register with only the multiplier coefficients of the taps being varied.

13. As of the filing date of the above identified application, one of ordinary skill in the art

would know that Kirby's 32 does not provide variable delay as in the application's presently amended claims, and thus does not perform variable delay of the talent signal (Kirby's 12) in response to the mix minus signal (Kirby's 34) as claimed in several of these claims.

14. In respect to Kirby's 32 providing variable gain to the talent signal (Kirby's 12), to the extent that it might do so it applies the gain only to the delayed version of the talent signal, not to the undelayed version.

15. The examiner asserts that Kirby's variable delay 21 may not change delay at a particular instant. The examiner appears to imply that the variable delay 21 is not continuously varying the delay of the feedback signal (Kirby's 14). I believe that one of ordinary skill in the art would not find that the fact that the variable delay 21 is not continuously varying the feedback signal delay to be of little consequence in respect to the claim elements which call for the absence of a variable delay of the feedback signal.

16. At page 6, column 2, lines 2 & 3 Kirby teaches to change the delays 21 and 22 as changes in the relative delay of the incoming signals are detected. However even if the delay 21 would not change for an instant, Kirby's mixed signal 14 is nevertheless **delayed and applied to the combiner 40 by use of the variable delay circuit 21.**

17. There is no suggestion to one of ordinary skill in the art found in Kirby to eliminate variable delay 21 and apply the mixed signal 14 directly to 40. Indeed Kirby would not operate without variable delay 21.

18. One of ordinary skill in the art would know that the present application's claim language in respect to applying the feedback signal without further variable delay is not restricted to a specific instant in time, rather one of ordinary skill in the art would recognize and know that this language in the claims pertains to the overall operation of the invention, rather than a brief selected instant of operation.

19. Several claims recite a parameter or adjustment in an "amount set by a human operator". This feature is not taught by Kirby.

20. Kirby's description of 22 consistently characterizes 22 (and 21) as an automatically variable delay in which the amount of delay is responsive to 10.

21. The examiner points the Kirby's automatically set delay 22 as being set by a human operator. I do not find any teaching in Kirby which would cause one of ordinary skill in the art to recognize a human operator setting or provide any support from Kirby's teachings for the examiner's position.

22. In the 8/28/01 office action the examiner rejected Claims 4-19, 23-39, 41, 42, 45, 47-48, 51-53 under 35 U.S.C. 102(b), but did not point to where the features of those Claims are found in Kirby.

23. Several claims of the application call for a correlation circuit in various combinations which correlate the locally produced audio talent signal with the audio talent signal which is returned from the station with the correlation being in direct (comparison of talent and feedback signal) or recursive (comparison of talent and mix minus signal) form to determine or otherwise respond to the delay therebetween.

24. There is no corresponding audio delay responsive correlation circuit in Kirby. It is noted that Kirby does suggest (1st paragraph at page 4) that delay measuring system 10 may utilize "The Phase Correlation Image Alignment Method" by Kuglin and Hines, which paper shows an image or video phase alignment technique which utilizes the phase of the two images.

25. The Kuglin & Hines paper does not enable one of ordinary skill in the art to utilize its teaching of phase correlation of images for measuring the delay of audio signals.

26. The Kuglin & Hines paper teaches away from the use of correlation such as taught in RE 33,535 for measuring audio delay by pointing the person of ordinary skill to the use of

correlation for measuring image phase for the purposes of image matching. The two correlations are markedly different.

27. Assuming arguendo that Kuglin & Hines somehow enables the use of phase correlation technique for audio signals, one of ordinary skill in the art would know that a phase measurement is not the same as a delay measurement.

28. One of ordinary skill in the art would know that phase is a cycle to cycle characteristic which repeats as two signals are offset in time. By contrast, one of ordinary skill in the art would know that delay is a linear measure which uniformly increases as signals are offset in time.

29. One of ordinary skill in the art would know that by measure of the relative phase of two signals, it can not be known what the relative delay of the two signals is. For example one of ordinary skill would know if the signal period is 16 milliseconds (a typical number for images in a video signal) and the phase is 180 degrees (8ms), the delay between the signals could be any multiple of the period plus 180 degrees, i.e. 8 ms, 24 ms, 40 ms, etc..

30. One of ordinary skill in the art would be directed away from the claimed use of correlation responsive to the delay of two audio signals by the Kuglin reference which teaches image registration techniques.

I hereby declare that all statements made herein of my own knowledge are true, that all information made on information and belief are believed to be true, and that all opinions expressed are true in my professional opinion; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine and imprisonment, or both, under Section 1001 of Title 18 of the United States Code.


J. Carl Cooper 10/3/01